

WHAT IS CLAIMED IS:

1. A SIMD type processor comprising:

a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry  
5 out an arithmetic processing to given data;

a data providing unit that provides data to be arithmetically processed to the parallel processing unit;

an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to  
10 each of the arithmetic unit;

an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel processing unit;

15 a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit  
20 when the decision unit has decided that the interruption processing is to be carried out; and

a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption  
25 processing to the parallel processing unit in place of the

parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

5     2.     The SIMD type processor according to claim 1, further comprising an instruction storing unit that stores the instruction.

10     3.     The SIMD type processor according to claim 1, further comprising:

        a storing unit that stores suspension information consisting of data and an instruction at a point of time when a parallel processing has been suspended by the suspending unit;

15          a detecting unit that detects whether the interruption processing has been finished or not; and

        a transmission unit that transmits the suspension information stored by the storing unit to an original position when the detecting unit has detected a finish of  
20     the interruption processing.

4.     The SIMD type processor according to claim 2, further comprising:

        a program counter; and  
25          an accumulator that is used in the arithmetic units,

wherein the program counter assigns an instruction stored by the instruction storing unit, and each arithmetic units carries out the arithmetic processing using the accumulator.

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5. The SIMD type processor according to claim 3, further comprising:

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a program counter;
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an accumulator and a resistor that are used in the

10 arithmetic units; and

a data register that stores data provided by the data providing unit,

wherein the suspension information consists of a program counter value, contents of the accumulator and the register, and data stored in the data register, at a point  
15 of time when a parallel processing has been suspended by the suspending unit.

6. The SIMD type processor according to claim 3,  
20 wherein the storing unit stores various parameter data  
that are necessary for the arithmetic processing carried  
out by the arithmetic units.

7. An image processing apparatus comprising:  
an image data control unit connected to,  
an image memory control unit that controls an image  
reader that reads image data and/or an image memory thereby  
5 to write/read image data and/or an image writer that writes  
image data onto a transcription sheet; and  
an image processing unit that carries out an image  
processing of image data such as an editing of image data,  
that receives at least third image data out of first  
10 image data that has been read by the image reader, second  
image data that has been read by the image memory control  
unit, and said third image data that has been image processed  
by the image processing unit, and  
that transmits at least the third image data out of  
15 the first image data, the second image data, and the third  
imaged data, to the image memory control unit and/or the  
image processing unit and/or the image writer,  
wherein at least the image processing unit has a SIMD  
type processor, which SIMD type processor includes,  
20 a parallel processing unit that carries out a parallel  
processing using a plurality of arithmetic units which carry  
out an arithmetic processing to given data;  
a data providing unit that provides data to be  
arithmetically processed to the parallel processing unit;  
25 an instruction providing unit that provides the same

instruction for carrying out the arithmetic processing to each of the arithmetic unit;

an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel processing unit;

a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

10 a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

8. An image processing apparatus comprising:  
an image memory control unit connected to,  
an image reader that reads image data and/or an image writer that writes image data onto a transcription sheet;

and

an image processing unit that carries out an image processing of image data such as an editing of image data,

that receives at least second image data out of first  
5 image data that has been read by the image reader, and said second image data that has been image processed by the image processing unit, and

that stores at least the second image data out of the first image data and the second image data, into an image  
10 memory, and transmits the image data stored in the image memory to the image processing unit and/or the image writer,

wherein at least the image processing unit has a SIMD type processor, which SIMD type processor includes,

a parallel processing unit that carries out a parallel  
15 processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

a data providing unit that provides data to be arithmetically processed to the parallel processing unit;

an instruction providing unit that provides the same  
20 instruction for carrying out the arithmetic processing to each of the arithmetic unit;

an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel  
25 processing unit;

a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

a suspending unit that suspends a parallel processing  
5 currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

a control unit that controls the data providing unit and the instruction providing unit so as to provide data  
10 to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

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9. The image processing apparatus according to claim 8, wherein the image memory control unit is connected to the image processing unit, the image reader and/or the image writer via the image data control unit, and

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the image data control unit transmits and receives image data between the image memory control unit, the image processing unit, the image reader and/or the image writer.

10. The image processing apparatus comprising:

an image processing unit that is connected to an image reader that reads image data and/or image memory a control unit that controls an image memory to write/read image data  
5 and/or an image writer that writes image data onto a transcription sheet,

that receives first image data that has been read by the image reader and/or second image data that has been read by the image memory control unit, and

10 that carries out an image processing of the first image data and/or the second image data such as an editing of image data, and transmits the image-processed image data to the image memory control unit and/or the image writer, wherein

at least the image processing unit has a SIMD type  
15 processor, which SIMD type processor includes,

a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

a data providing unit that provides data to be  
20 arithmetically processed to the parallel processing unit;

an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to each of the arithmetic unit;

an input unit that inputs an interruption request for  
25 carrying out other parallel processing by interrupting a



parallel processing currently carried out by the parallel processing unit;

a decision unit that makes a decision as to whether a parallel processing requested by the interruption request  
5 input from the input unit is to be carried out or not;

a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

10 a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and  
15 to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

11. The image processing apparatus according to claim 10,  
wherein the image processing unit is connected to the  
20 image reader and/or the image memory control unit and/or the image writer via the image data control unit, and

the image data control unit transmits and receives image data between the image processing unit, the image reader and/or the image memory control unit and/or the image  
25 writer.

12. The image processing apparatus according to claim 7,  
further comprising:

a facsimile control unit that is connected to the image  
memory control unit and/or the image data control unit, and  
5 that carries out transmission and reception of a facsimile  
image.

13. The image processing apparatus according to claim 8,  
further comprising:

10 a facsimile control unit that is connected to the image  
memory control unit and/or the image data control unit, and  
that carries out transmission and reception of a facsimile  
image.

15 14. The image processing apparatus according to claim 10,  
further comprising:

a facsimile control unit that is connected to the image  
memory control unit and/or the image data control unit, and  
that carries out transmission and reception of a facsimile  
20 image.

15. The image processing apparatus according to claim 7,  
wherein the image reader and/or the image data control  
unit and/or the image memory control unit and/or the image  
25 processing unit and/or the image writer an/or the facsimile

control unit are structured as independent units respectively.

16. The image processing apparatus according to claim 8,  
5 wherein the image reader and/or the image data control unit and/or the image memory control unit and/or the image processing unit and/or the image writer an/or the facsimile control unit are structured as independent units respectively.

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17. The image processing apparatus according to claim 10,  
wherein the image reader and/or the image data control unit and/or the image memory control unit and/or the image processing unit and/or the image writer an/or the facsimile  
15 control unit are structured as independent units respectively.

18. A copier comprising a SIMD type processor, which SIMD type processor includes,

20 a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

a data providing unit that provides data to be arithmetically processed to the parallel processing unit;

25 an instruction providing unit that provides the same

instruction for carrying out the arithmetic processing to each of the arithmetic unit;

an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel processing unit;

a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

10 a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

19. A printer comprising a SIMD type processor, which SIMD type processor includes,

a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry

out an arithmetic processing to given data;

a data providing unit that provides data to be arithmetically processed to the parallel processing unit;

an instruction providing unit that provides the same  
5 instruction for carrying out the arithmetic processing to each of the arithmetic unit;

an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel  
10 processing unit;

a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

a suspending unit that suspends a parallel processing  
15 currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

a control unit that controls the data providing unit and the instruction providing unit so as to provide data  
20 to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

20. A facsimile machine comprising a SIMD type processor,  
which SIMD type processor includes,

a parallel processing unit that carries out a parallel  
processing using a plurality of arithmetic units which carry  
5 out an arithmetic processing to given data;

a data providing unit that provides data to be  
arithmetically processed to the parallel processing unit;

an instruction providing unit that provides the same  
instruction for carrying out the arithmetic processing to  
10 each of the arithmetic unit;

an input unit that inputs an interruption request for  
carrying out other parallel processing by interrupting a  
parallel processing currently carried out by the parallel  
processing unit;

15 a decision unit that makes a decision as to whether  
a parallel processing requested by the interruption request  
input from the input unit is to be carried out or not;

a suspending unit that suspends a parallel processing  
currently being carried out by the parallel processing unit  
20 when the decision unit has decided that the interruption  
processing is to be carried out; and

a control unit that controls the data providing unit  
and the instruction providing unit so as to provide data  
to be arithmetically processed by the interruption  
25 processing to the parallel processing unit in place of the

parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

5 21. A scanner comprising a SIMD type processor, which SIMD type processor includes,

a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

10 a data providing unit that provides data to be arithmetically processed to the parallel processing unit;

an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to each of the arithmetic unit;

15 an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel processing unit;

a decision unit that makes a decision as to whether  
20 a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit when the decision unit has decided that the interruption  
25 processing is to be carried out; and

a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

22. A parallel processing apparatus comprising:

10 a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

a data providing unit that provides data to be arithmetically processed to the parallel processing unit;

15 an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to each of the arithmetic unit;

an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel processing unit;

a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

25 a suspending unit that suspends a parallel processing



currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

5 a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out  
10 the interruption processing to each of the arithmetic units.

23. The parallel processing apparatus according to claim 22, further comprising an instruction storing unit that stores the instruction.

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24. The parallel processing apparatus according to claim 22, further comprising:

a storing unit that stores suspension information consisting of data and an instruction at a point of time  
20 when a parallel processing has been suspended by the suspending unit;

a detecting unit that detects whether the interruption processing has been finished or not; and

a transmission unit that transmits the suspension  
25 information stored by the storing unit to an original

position when the detecting unit has detected a finish of the interruption processing.

25. The parallel processing apparatus according to claim  
5 22, further comprising:

a program counter; and  
an accumulator that is used in the arithmetic units,  
wherein the program counter assigns an instruction  
stored by the instruction storing unit, and each arithmetic  
10 units carries out the arithmetic processing using the  
accumulator.

26. The parallel processing apparatus according to claim  
24, further comprising:

15 a program counter;  
an accumulator and a resistor that are used in the  
arithmetic units; and

a data register that stores data provided by the data  
providing unit,

20 wherein the suspension information consists of a  
program counter value, contents of the accumulator and the  
register, and data stored in the data register, at a point  
of time when a parallel processing has been suspended by  
the suspending unit.

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27. The parallel processing apparatus according to claim  
24,

wherein the storing unit stores various parameter data  
that are necessary for the arithmetic processing carried  
5 out by the arithmetic units.

28. An image processing apparatus comprising:

an image data control unit connected to,

an image memory a control unit that controls an image  
10 reader that reads image data and/or an image memory thereby  
to write/read image data and/or an image writer that writes  
image data onto a transcription sheet; and

an image processing unit that carries out an image  
processing of image data such as an editing of image data,  
15 that receives at least third image data out of first  
image data that has been read by the image reader, second  
image data that has been read by the image memory control  
unit, and said third image data that has been image processed  
by the image processing unit, and

20 that transmits at least the third image data out of  
the first image data, the second image data, and the third  
imaged data, to the image memory control unit and/or the  
image processing unit and/or the image writer,

wherein at least the image processing unit out of all  
25 said units has a parallel processing apparatus, which

parallel processing apparatus includes,

a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

5 a data providing unit that provides data to be arithmetically processed to the parallel processing unit;

an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to each of the arithmetic unit;

10 an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel processing unit;

15 a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit when the decision unit has decided that the interruption  
20 processing is to be carried out; and

a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the  
25 parallel processing suspended by the suspending unit and

to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

29. An image processing apparatus comprising:

5 an image memory control unit connected to,  
an image reader that reads image data and/or an image writer that writes image data onto a transcription sheet;  
and

an image processing unit that carries out an image  
10 processing of image data such as an editing of image data,  
that receives at least second image data out of first image data that has been read by the image reader, and said second image data that has been image processed by the image processing unit, and

15 that stores at least the second image data out of the first image data and the second image data, into an image memory, and transmits the image data stored in the image memory to the image processing unit and/or the image writer,

wherein at least the image processing unit out of all  
20 said units has a parallel processing apparatus, which parallel processing apparatus includes,

a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

25 a data providing unit that provides data to be

arithmetically processed to the parallel processing unit;

an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to each of the arithmetic unit;

5            an input unit that inputs an interruption request for  
carrying out other parallel processing by interrupting a  
parallel processing currently carried out by the parallel  
processing unit;

a decision unit that makes a decision as to whether  
10 a parallel processing requested by the interruption request  
input from the input unit is to be carried out or not;

a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

30. The image processing apparatus according to claim 29,  
wherein the image memory control unit is connected  
to the image processing unit, the image reader and/or the  
image writer via the image data control unit, and

5 the image data control unit transmits and receives  
image data between the image memory control unit, the image  
processing unit, the image reader and/or the image writer.

31. The image processing apparatus comprising:

10 image processing unit connected to an image reader  
that reads image data and/or image memory a control unit  
that controls an image memory to write/read image data and/or  
an image writer that writes image data onto a transcription  
sheet,

15 that receives first image data that has been read by  
the image reader and/or second image data that has been read  
by the image memory control unit, and

that carries out an image processing of the first image  
data and/or the second image data such as an editing of image  
20 data, and transmits the image-processed image data to the  
image memory control unit and/or the image writer,

wherein at least the image processing unit out of all  
said units has a parallel processing apparatus, which  
parallel processing apparatus includes,

25 a parallel processing unit that carries out a parallel

processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

a data providing unit that provides data to be arithmetically processed to the parallel processing unit;

5 an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to each of the arithmetic unit;

an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a  
10 parallel processing currently carried out by the parallel processing unit;

a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

15 a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

a control unit that controls the data providing unit  
20 and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out  
25 the interruption processing to each of the arithmetic units.



32. The image processing apparatus according to claim 31,  
wherein the image processing unit is connected to the  
image reader and/or the image memory control unit and/or  
the image writer via the image data control unit, and

5 the image data control unit transmits and receives  
image data between the image processing unit, the image  
reader and/or the image memory control unit and/or the image  
writer.

10 33. The image processing apparatus according to claim 28,  
further comprising:

a facsimile control unit that is connected to the image  
memory control unit and/or the image data control unit, and  
that carries out transmission and reception of a facsimile  
15 image.

34. The image processing apparatus according to claim 29,  
further comprising:

a facsimile control unit that is connected to the image  
20 memory control unit and/or the image data control unit, and  
that carries out transmission and reception of a facsimile  
image.

35. The image processing apparatus according to claim 31,  
further comprising:

a facsimile control unit that is connected to the image  
memory control unit and/or the image data control unit, and  
5 that carries out transmission and reception of a facsimile  
image.

36. The image processing apparatus according to claim 28,  
wherein the image reader and/or the image data control  
10 unit and/or the image memory control unit and/or the image  
processing unit and/or the image writer an/or the facsimile  
control unit are structured as independent units  
respectively.

37. The image processing apparatus according to claim 29,  
wherein the image reader and/or the image data control  
unit and/or the image memory control unit and/or the image  
processing unit and/or the image writer an/or the facsimile  
control unit are structured as independent units  
20 respectively.

38. The image processing apparatus according to claim 31,  
wherein the image reader and/or the image data control  
unit and/or the image memory control unit and/or the image  
25 processing unit and/or the image writer an/or the facsimile

control unit are structured as independent units respectively.

39. A copier comprising a parallel processing apparatus,  
5 which parallel processing apparatus includes,

a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

a data providing unit that provides data to be  
10 arithmetically processed to the parallel processing unit;

an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to each of the arithmetic unit;

an input unit that inputs an interruption request for  
15 carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel processing unit;

a decision unit that makes a decision as to whether a parallel processing requested by the interruption request  
20 input from the input unit is to be carried out or not;

a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

25 a control unit that controls the data providing unit

and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and  
5 to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

40. A printer comprising a parallel processing apparatus, which parallel processing apparatus includes,
- 10 a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;
- a data providing unit that provides data to be arithmetically processed to the parallel processing unit;
- 15 an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to each of the arithmetic unit;
- an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a  
20 parallel processing currently carried out by the parallel processing unit;
- a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;
- 25 a suspending unit that suspends a parallel processing

currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

5 a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out  
10 the interruption processing to each of the arithmetic units.

41. A facsimile machine comprising a parallel processing apparatus, which parallel processing apparatus includes,

15 a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

a data providing unit that provides data to be arithmetically processed to the parallel processing unit;

20 an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to each of the arithmetic unit;

25 an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel processing unit;

a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit when the decision unit has decided that the interruption processing is to be carried out; and

a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

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42. A scanner comprising a parallel processing apparatus, which parallel processing apparatus includes,

a parallel processing unit that carries out a parallel processing using a plurality of arithmetic units which carry out an arithmetic processing to given data;

a data providing unit that provides data to be arithmetically processed to the parallel processing unit;

an instruction providing unit that provides the same instruction for carrying out the arithmetic processing to each of the arithmetic unit;

an input unit that inputs an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out by the parallel processing unit;

5        a decision unit that makes a decision as to whether a parallel processing requested by the interruption request input from the input unit is to be carried out or not;

         a suspending unit that suspends a parallel processing currently being carried out by the parallel processing unit  
10        when the decision unit has decided that the interruption processing is to be carried out; and

         a control unit that controls the data providing unit and the instruction providing unit so as to provide data to be arithmetically processed by the interruption  
15        processing to the parallel processing unit in place of the parallel processing suspended by the suspending unit and to provide the same instruction necessary for carrying out the interruption processing to each of the arithmetic units.

20        43.    A parallel processing method comprising:

         a data providing step of providing data to be processed as a parallel processing;

         an instruction providing step of providing an instruction necessary for carrying out the parallel  
25        processing;

a parallel-processing step of carrying out a parallel processing of the data provided at the data providing step, based on the instruction provided at the instruction providing step;

5 an input step of inputting an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out at the parallel-processing step;

10 a decision step of making a decision as to whether an interruption processing of the parallel processing requested at the input step is to be carried out or not;

a suspending step of suspending a parallel processing currently being carried out at the parallel-processing step when a decision has been made at the decision step that the  
15 interruption processing is to be carried out; and

a replacing step of providing data to be parallel processed by the interruption processing and an instruction necessary for carrying out the interruption processing, in place of the parallel processing suspended at the suspending  
20 step.

44. The parallel processing method according to claim 43, further comprising:

a saving step of saving data and an instruction at  
25 a point of time when a parallel processing has been suspended



at the suspending step;

a detecting step of detecting whether the interruption processing has been finished or not; and

a restoring step of restoring the data and the instruction saved at the saving step to an original state at the point of time when the processing has been suspended at the suspending step, when a finish of the interruption processing has been detected at the detecting step.

10 45. An image processing method comprising:

an image data receiving step of receiving image data from any one processing unit out of a plurality of processing units that carry out different kinds of processing of image data such as an image data reading processing, an image data storing processing, an image (editing) processing, and a transmission/reception processing;

an image data control information obtaining step of obtaining image data control information that includes information relating to the contents of processing of the image data received at the image data receiving step;

a transmission destination processing unit determining step of determining a processing unit at a transmission destination to which the image data received at the image data receiving step is to be transmitted, based on the image data control information obtained at the image

data control information obtaining step; and

a transmission step of transmitting the image data  
to the transmission destination processing unit that has  
been determined at the transmission destination processing  
5 unit determining step, wherein

the processing of the image data in at least one  
processing unit among the plurality of processing units  
includes a parallel processing method, which parallel  
processing method includes the steps of,

10 a data providing step of providing data to be processed  
as a parallel processing;

an instruction providing step of providing an  
instruction necessary for carrying out the parallel  
processing;

15 a parallel-processing step of carrying out a parallel  
processing of the data provided at the data providing step,  
based on the instruction provided at the instruction  
providing step;

an input step of inputting an interruption request  
20 for carrying out other parallel processing by interrupting  
a parallel processing currently carried out at the  
parallel-processing step;

a decision step of making a decision as to whether  
an interruption processing of the parallel processing  
25 requested at the input step is to be carried out or not;

a suspending step of suspending a parallel processing currently being carried out at the parallel-processing step when a decision has been made at the decision step that the interruption processing is to be carried out; and

5 a replacing step of providing data to be parallel processed by the interruption processing and an instruction necessary for carrying out the interruption processing, in place of the parallel processing suspended at the suspending step.

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46. The image processing method according to claim 45, further comprising a control information input step of inputting the image data control information,

15 wherein at the image data control information obtaining step, the image data control information input at the control information input step is obtained.

47. The image processing method according to claim 45, wherein the image processing method is used for a  
20 correction processing for correcting information deterioration of image data or a picture quality processing corresponding to image data corrected by the correction processing or image data corresponding to an image forming characteristic.

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48. A computer readable medium for storing instructions,  
which when executed on a computer, causes the computer to  
perform the steps of:

a data providing step of providing data to be processed  
5 as a parallel processing;

an instruction providing step of providing an  
instruction necessary for carrying out the parallel  
processing;

a parallel-processing step of carrying out a parallel  
10 processing of the data provided at the data providing step,  
based on the instruction provided at the instruction  
providing step;

an input step of inputting an interruption request  
for carrying out other parallel processing by interrupting  
15 a parallel processing currently carried out at the  
parallel-processing step;

a decision step of making a decision as to whether  
an interruption processing of the parallel processing  
requested at the input step is to be carried out or not;

20 a suspending step of suspending a parallel processing  
currently being carried out at the parallel-processing step  
when a decision has been made at the decision step that the  
interruption processing is to be carried out; and

a replacing step of providing data to be parallel  
25 processed by the interruption processing and an instruction

necessary for carrying out the interruption processing, in place of the parallel processing suspended at the suspending step.

- 5 49. A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform the steps of:

an image data receiving step of receiving image data from any one processing unit out of a plurality of processing  
10 units that carry out different kinds of processing of image data such as an image data reading processing, an image data storing processing, an image (editing) processing, and a transmission/reception processing;

an image data control information obtaining step of  
15 obtaining image data control information that includes information relating to the contents of processing of the image data received at the image data receiving step;

a transmission destination processing unit  
determining step of determining a processing unit at a  
20 transmission destination to which the image data received at the image data receiving step is to be transmitted, based on the image data control information obtained at the image data control information obtaining step; and

a transmission step of transmitting the image data  
25 to the transmission destination processing unit that has

been determined at the transmission destination processing unit determining step, wherein

the processing of the image data in at least one processing unit among the plurality of processing units  
5 includes a parallel processing method, which parallel processing method includes the steps of,

a data providing step of providing data to be processed as a parallel processing;

an instruction providing step of providing an  
10 instruction necessary for carrying out the parallel processing;

a parallel-processing step of carrying out a parallel processing of the data provided at the data providing step, based on the instruction provided at the instruction  
15 providing step;

an input step of inputting an interruption request for carrying out other parallel processing by interrupting a parallel processing currently carried out at the parallel-processing step;

20 a decision step of making a decision as to whether an interruption processing of the parallel processing requested at the input step is to be carried out or not;

a suspending step of suspending a parallel processing currently being carried out at the parallel-processing step  
25 when a decision has been made at the decision step that the

interruption processing is to be carried out; and

a replacing step of providing data to be parallel  
processed by the interruption processing and an instruction  
necessary for carrying out the interruption processing, in  
5 place of the parallel processing suspended at the suspending  
step.